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Characterization of human homologue of 4-1BB and its ligand.

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The human homologue of 4-1BB (H4-1BB) cDNA was isolated from PMA plus ionomycin-treated human peripheral T-cell cDNA libraries. The amino acid sequence deduced from the nucleotide sequence showed that the protein is composed of 255 amino acids with 2 potential N-linked glycosylation sites. The molecular weight of its protein backbone is calculated to be 27 kDa. The H4-1BB contains features such as signal sequence and transmembrane domain, indicating that it is a receptor protein. This protein showed 60% identity of amino acid sequence to mouse 4-1BB. In the cytoplasmic domain there are 5 regions of amino acid sequences conserved from mouse to human, indicating that these residues might be important in the 4-1BB function. H4-1BB mRNA was detected in unstimulated peripheral blood T cells and was inducible in T-cell lines such as Jurkat and CEM. H4-1BB-AP, a fusion protein between the H4-1BB extracellular domain and alkaline phosphatase, was used to identify the ligand for the H4-1BB. Although the H4-1BB ligand was detected in both T and B cells of human peripheral blood, the ligand was preferentially expressed in primary B cells and B-cell lines. Daudi, a B-cell lymphoma, was one of the B-cell lines that carried a higher number of ligands. Scatchard analysis showed that the Kd = 1.4 x 10(9) M and the number of ligands in Daudi cell was 4.2 x 10(3).

MeSH Terms:

- 3T3 Cells
- Amino Acid Sequence
- Animal
- B-Lymphocytes/metabolism
- Base Sequence
- Comparative Study
- DNA, Complementary/genetics
- Human
- Leukemia, Lymphocytic, Acute/pathology
- Leukemia, T-Cell, Acute/pathology
- Lymphocyte Activation